1546 and 1547

Industrial PC/AT® Node Box Systems

User Manual

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All interface cables must include shielded cables. Braid/foil type shields are recommended. Communication cable connectors must be metal, ideally zinc die-cast backshell types, and provide 360-degree protection about the interface wires. The cable shield braid must be terminated directly to the metal connector shell; ground drain wires alone are not adequate.

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Chapter 1 – Introduction

Product Overview

The 1546 and 1547 Node Box Industrial PCs offer a powerful, compact package for the factory floor and other harsh environments. These node box industrial PCs feature an open architecture to meet a wide variety of applications that require both a powerful PC and a durable industrial enclosure. The systems integrate a computer card cage, mass storage, and power supply in a truly industrial form.

The processor board combines all the functions of a complete PC/AT® compatible computer on a single industrially hardened circuit board.

Standard Features

The 1546 and 1547 units come standard with the following features:

- AIM4 board
- Wall or shelf mountable
- Flash BIOS
- SATA HD controller for up to 2 drives
- Removable 40 or 80 GB SATA hard drive(s), rear access
- AGP Video Controller, 4M of system DRAM, up to 32M
- PCI local bus IDE controller (for CD/DVD and CF options)
- Two 240 pin DDR2 DIMM sockets that support 256MB, 512MB, 1GB and 2GB options
- Intel® Socket 478 Celeron® M or Pentium® M options up to 2.0GHz
- 400MHz or 533MHz front side bus depending on the processor type
- 1546 – Four AT bus expansion slots
- One PCI (8.0” max)
- One PCI (9.0” max)
- One ISA (9.0” max)
- One PCI or ISA slot (9.0” max)
- 1547 – Four AT bus expansion slots
- One ½ length PCI
- One full length PCI
- One full length ISA
- One full length PCI or ISA slot
- IBM® PS/2® keyboard port and mouse port

- Four serial COM ports, with three external ports configured as RS-232 and one configurable as either RS-232 or RS-422 or RS-485. The fourth port is an internal header only and defaulted as disabled.
- Parallel port
- VGA port
- Four USB 2.0 ports
- Legacy USB keyboard and mouse support
- Legacy USB floppy, USB CDROM, and USB mass storage support
- Two onboard Ethernet ports, one is a 10/100 BASE T and the other is 10/100/1000 BASE T
- Microsoft Windows XP® operating system
- Internal rear access Compact Flash (CF) interface
- 120/240 VAC 50/60Hz Auto switching power supply
- UL Listed for use in Class I and Class II, Division 2 hazardous locations, Groups A, B, C, D, F, and G

Optional Features

Following are optional available features of the 1546 and 1547:

- Higher capacity SATA hard drives and solid state drives
- Various CD/DVD drive options
- Internal rear access floppy
- Various processor speeds
- Preinstalled Windows® 2000, or Windows XP® Professional
- External 9000-USBF, USB floppy (requires Windows 2000, or XP)
- CompactFlash™ options up to 4GB
- 2.5” Dual hard drives
- 2.5” RAID array support
- 24VDC power supply (on 1547 units only)

The figures and tables on the next several pages illustrate the internal and external components on the front and back panels of the unit to help you locate the features of the 1546 and 1547 Node Boxes.

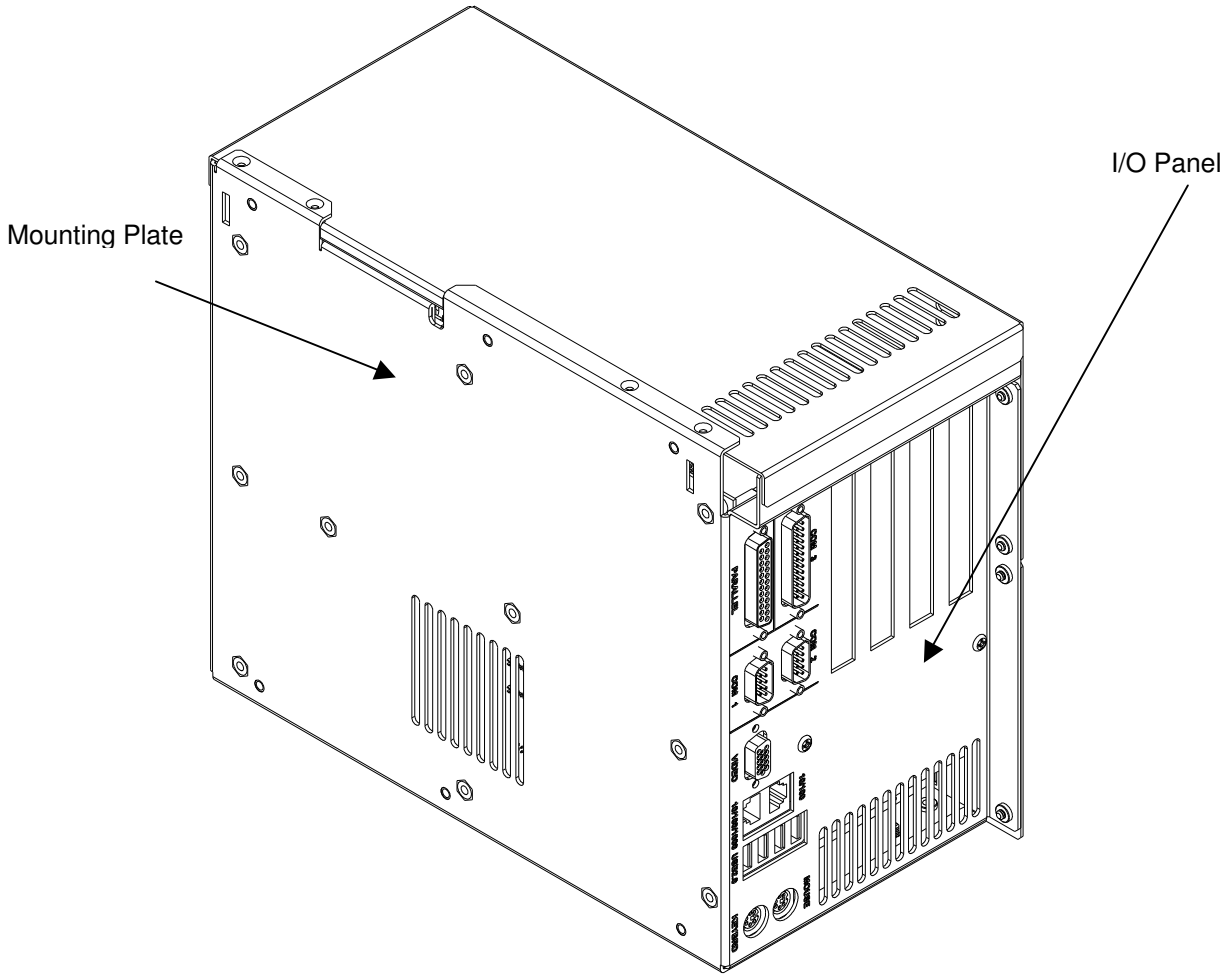
Mounting Plates

The following figures illustrated the mounting plates for the 1546 and 1547 systems.

1546 Mounting Plate

The 1546 mounting plate protects the system's interior when the system is properly mounted.

Figure 1-1. 1546 Mounting Plate



1547 Mounting Plate

The 1547 mounting plate protects the system's interior when the system is properly mounted .

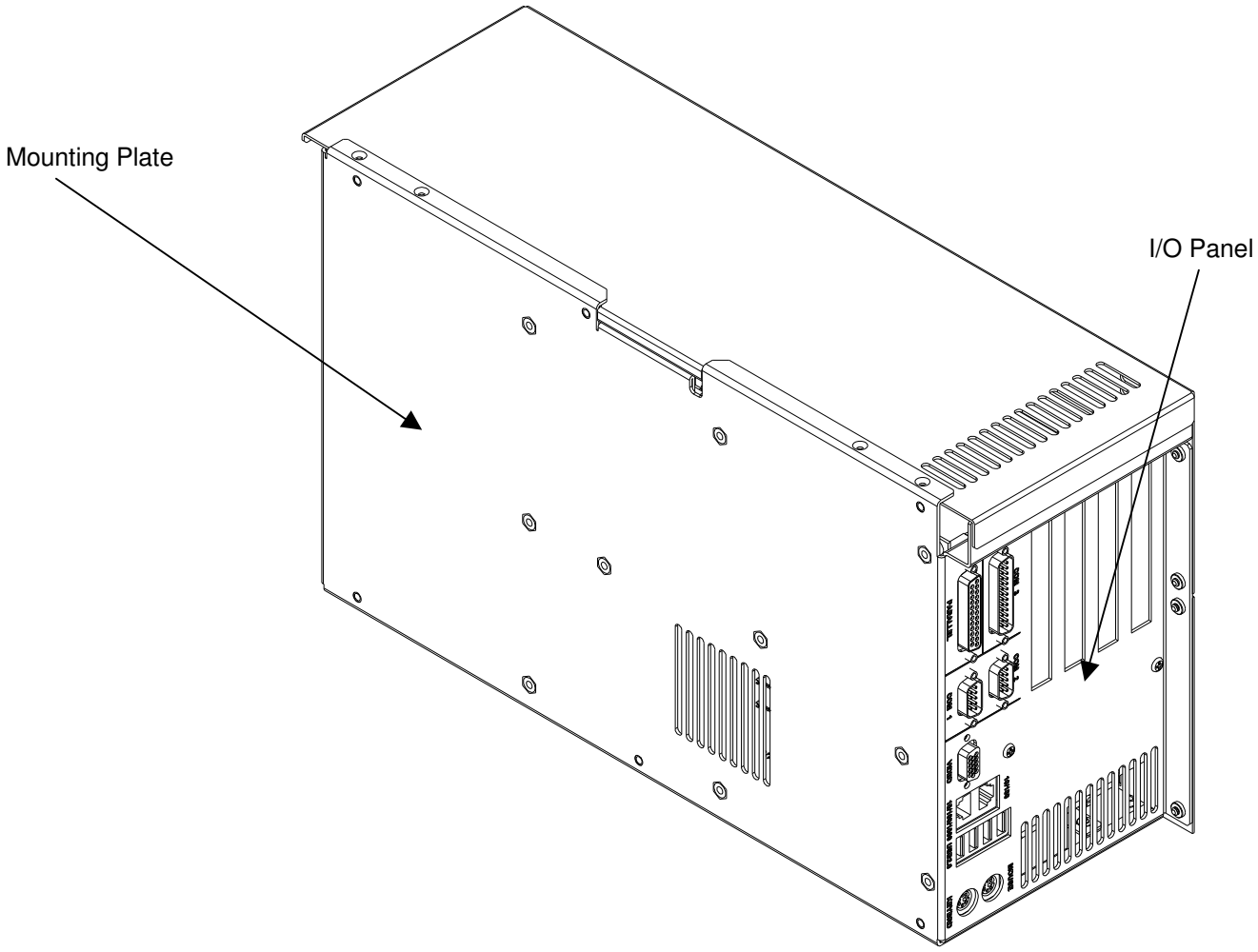


Figure 1-2. 1547 Mounting Plate

Back Panels and Power Panels

The following figures show the back panel and power panel of both the 1546 and 1547 Node Boxes.

1546 Back Panel and Power Panel

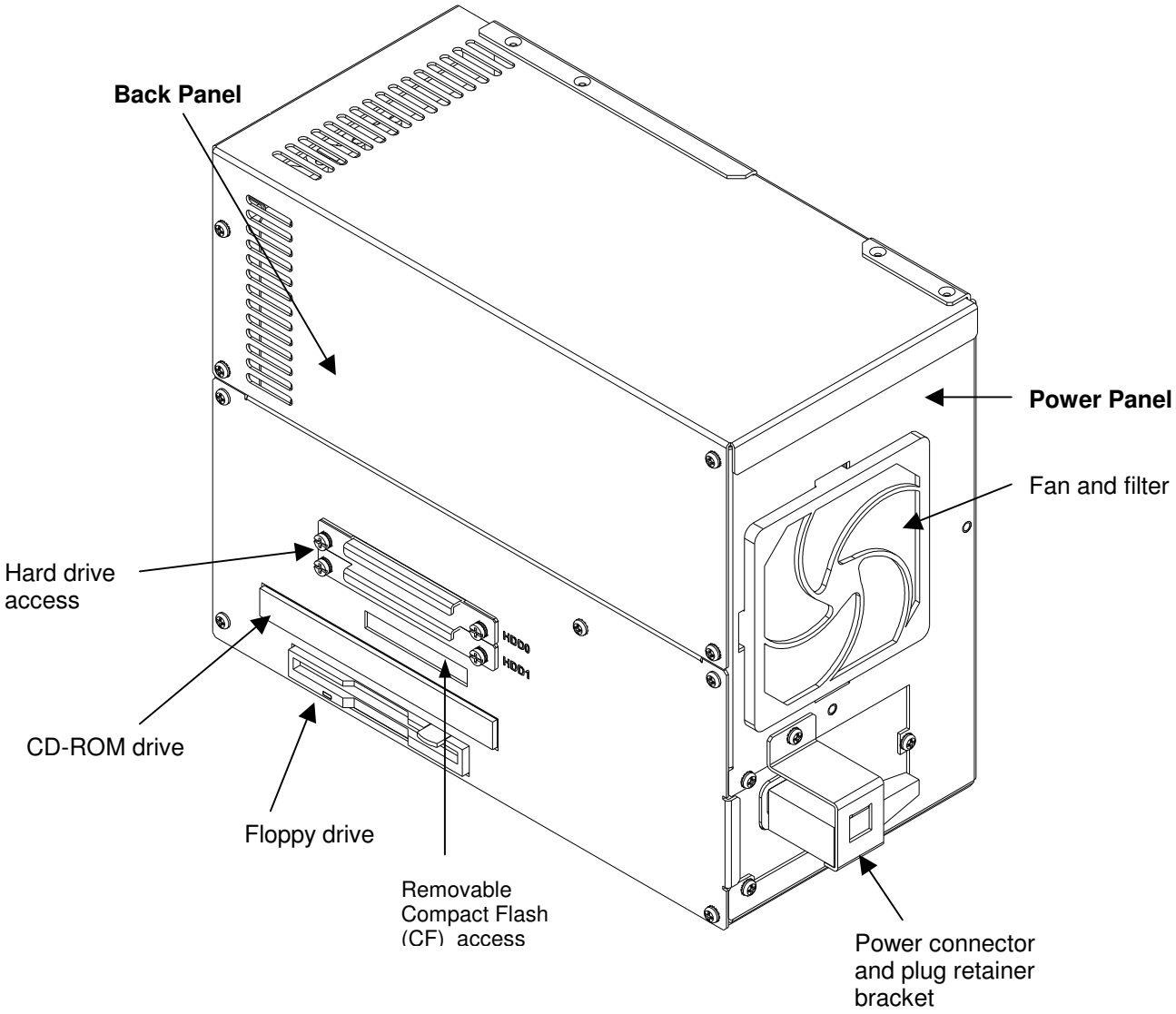


Figure 1-3. 1546 Back Panel and Power Panel

1547 Back Panel and Power Panel

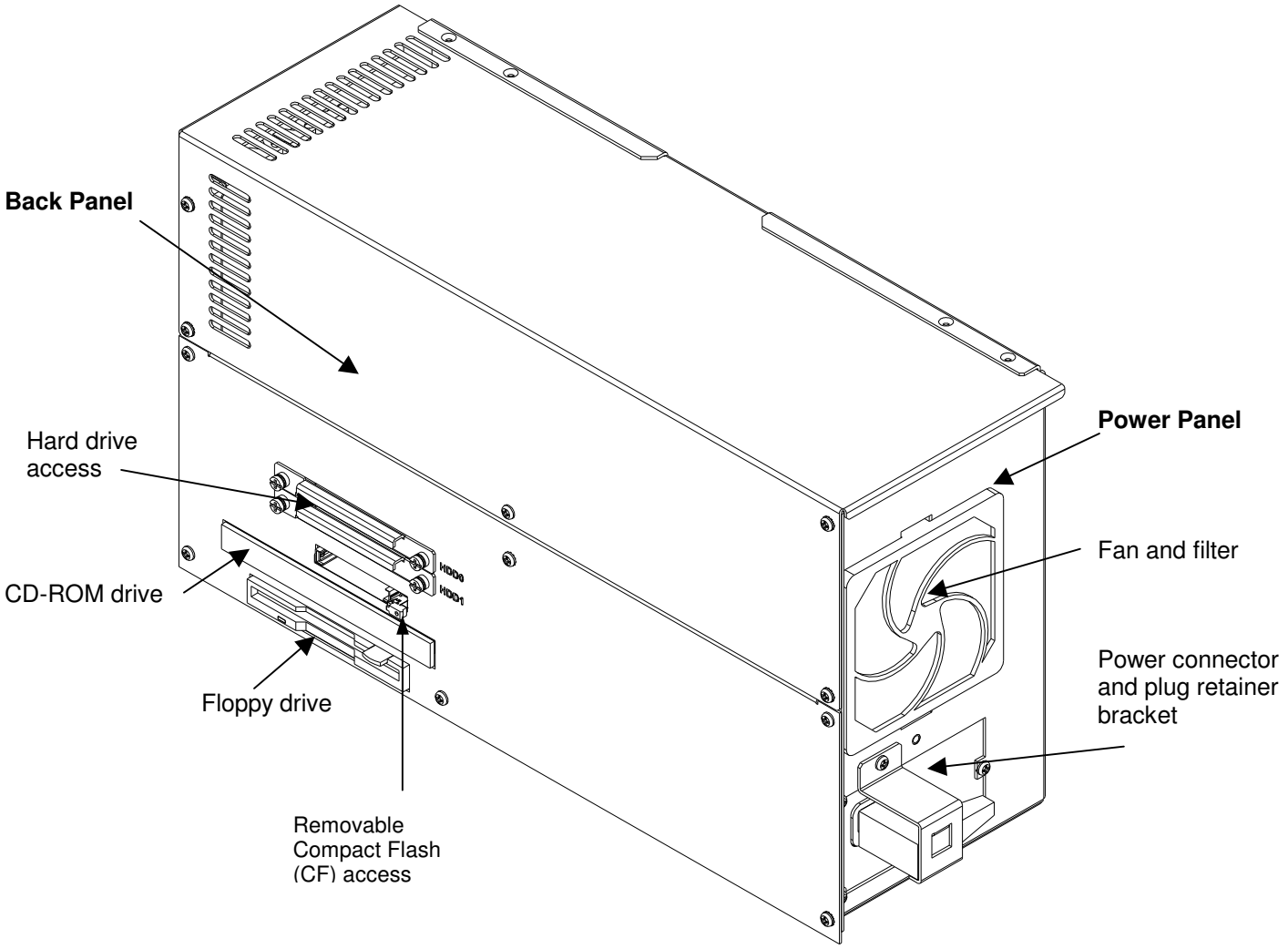


Figure 1-4. 1547 Back Panel and Power Panel

1546 and 1547 I/O Panel

The following figure and table outline the features of the I/O panel on the 1546 or 1547 Node Box.

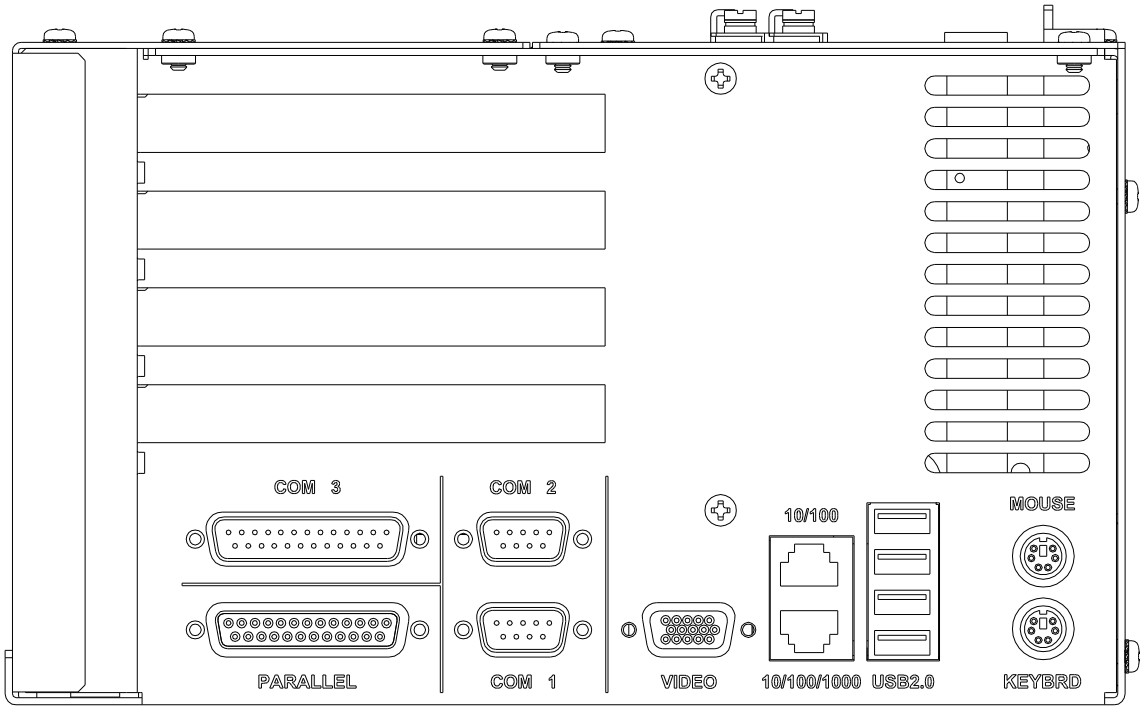


Figure 1-5. 1546 I/O Panel

Table 1-1. 1546 and 1547 I/O Panel

Feature	Description
Parallel Port	The parallel printer port (LPT1) is a DB-25 pin female connector. This port provides a standard PC-compatible printer interface.
COM Ports	Four serial COM ports, with three external ports configured as RS-232 and one configurable as either RS-232 or RS-422 or RS-485. The fourth port is an internal header only and defaulted as disabled. For more information see jumper details in Appendix D.
Keyboard Port	The keyboard port is a PS/2® stacked mini-DIN so a PC/AT® keyboard can be attached at the side of the unit. The keyboard port on the side of the unit is the lower connector. ***Warning: To maintain a safe condition, do not use an external keyboard and/or mouse port when the unit is operating in a hazardous environment.***

Table 1-1. 1546 and 1547 I/O Panel	
Feature	**Description**
Mouse Port	The mouse port is a PS/2 stacked mini-DIN that allows you to attach a mouse at the side of the unit. ***Warning: To maintain a safe condition, do not use an external keyboard and/or mouse port when the unit is operating in a hazardous environment.***
Video Port	The video port is a 15-pin D-sub VGA connector at the side of the unit. This connector supports any standard VGA connection. Both the LCD flat panel and video port are active as a default at boot time if video display devices are connected to them.
USB	The Universal Serial Bus (USB) port is a four high USB connector that is USB 2.0 compliant.
Ethernet Ports	One On-board 10/100 Base T RJ-45 Ethernet connector with LED's and one on-board 10/100/1000 Base T RJ-45 Ethernet connector with LED's

Unpacking the System

When you remove the system from its shipping container, verify that you have the parts listed below. Save the box and inner wrapping in the event you need to reship the unit.

- 1546 or 1547 unit
- Documentation kit, which includes:
- Power connector
- Cable clamp and screw (for strain relief of power cord)
- Documentation and Support Library CD-ROM
- Operating System Recovery Media or retail operating system (CD-ROM)
- Mounting hardware

Quick Startup

This section gives you the steps to get the system up and running without explaining the capabilities and options.

> **Warning**
>
> Remove power from the unit and disconnect the power cord before making any adjustments to the inside or outside of the computer.

> **Warning**
>
> For Hazardous Locations installation, review "Hazardous Locations Installation" in Chapter 2 before startup.

To prepare the system for use, perform the following steps.

1. Attach optional keyboard to the keyboard port.
2. Attach other optional equipment following the instructions in Chapter 2.
3. Attach the power cord from the power receptacle to a properly grounded 115/230 VAC, 50-60 Hz outlet. (See Chapter 2, *AC Power Cable*.)
4. Turn on power to the unit (via an outlet power switch if applicable). The system will boot up into the operating system.
5. If not pre-installed, install application software via the floppy, the CD-ROM, or a network.

Chapter 2 – Installation

This chapter offers detailed installation instructions and outlines the options for the 1546 and 1547 Node Boxes. The figures on the next several pages show the internal and external components of the units to help you locate features relevant to installation.

Installation Overview

> **Warning**
>
> For installation in Hazardous Locations, review the *Hazardous Locations Installation* section in this chapter before startup.

The rugged design of the 1546 and 1547 Node Boxes allows it to be installed in most industrial environments. The system is generally placed in a NEMA 4/4X/12 enclosure to protect against contaminants such as dust, and moisture. Metal enclosures also help minimize the effects of electromagnetic radiation that nearby equipment can generate. For Underwriters Laboratories (UL) compliance, the unit must be installed within a suitable fire enclosure.

Read the following sections carefully to be sure that you are complying with all the safety requirements.

1. Select a NEMA rated enclosure and place the unit to allow easy access to the system ports (see other sections in this chapter and Appendix A).
   - To assure a NEMA 4 seal choose an approved enclosure that has a 14-gauge (0.075 in/1.9 mm thick steel or 0.125 in/3.2 mm thick aluminum) front face.
   - Be sure to account for the unit's depth when choosing the depth of the enclosure.
2. Create a mounting location in the enclosure (see *System Mounting Dimensions*).
   - Be sure to place the unit at a comfortable working level
   - Make sure the area around the mounting location is clean and free from metal burrs
3. Mount the unit position and properly secure the unit into the panel.
   - Tighten the fourteen #10 screws to 20 inch-pounds (2.597 Newton-meters / 23Kgf cm).
4. Construct a power cable following the instructions in *AC Power Cable* in this chapter.

5. Attach one end of the power cord to the power receptacle on the unit and the other end to a properly grounded 115/230 VAC, 50-60 Hz outlet.
    - A ground path from the unit chassis to the enclosure chassis can be established using the 6-32 threaded ground point hole provided on the bottom panel of the unit
6. Turn on power to the system. The system will boot up the installed operating system.
7. Install the application software via a floppy drive, CD-ROM, or the network.

Additional aspects to take into account when mounting your 1546 and 1547 Node Boxes:

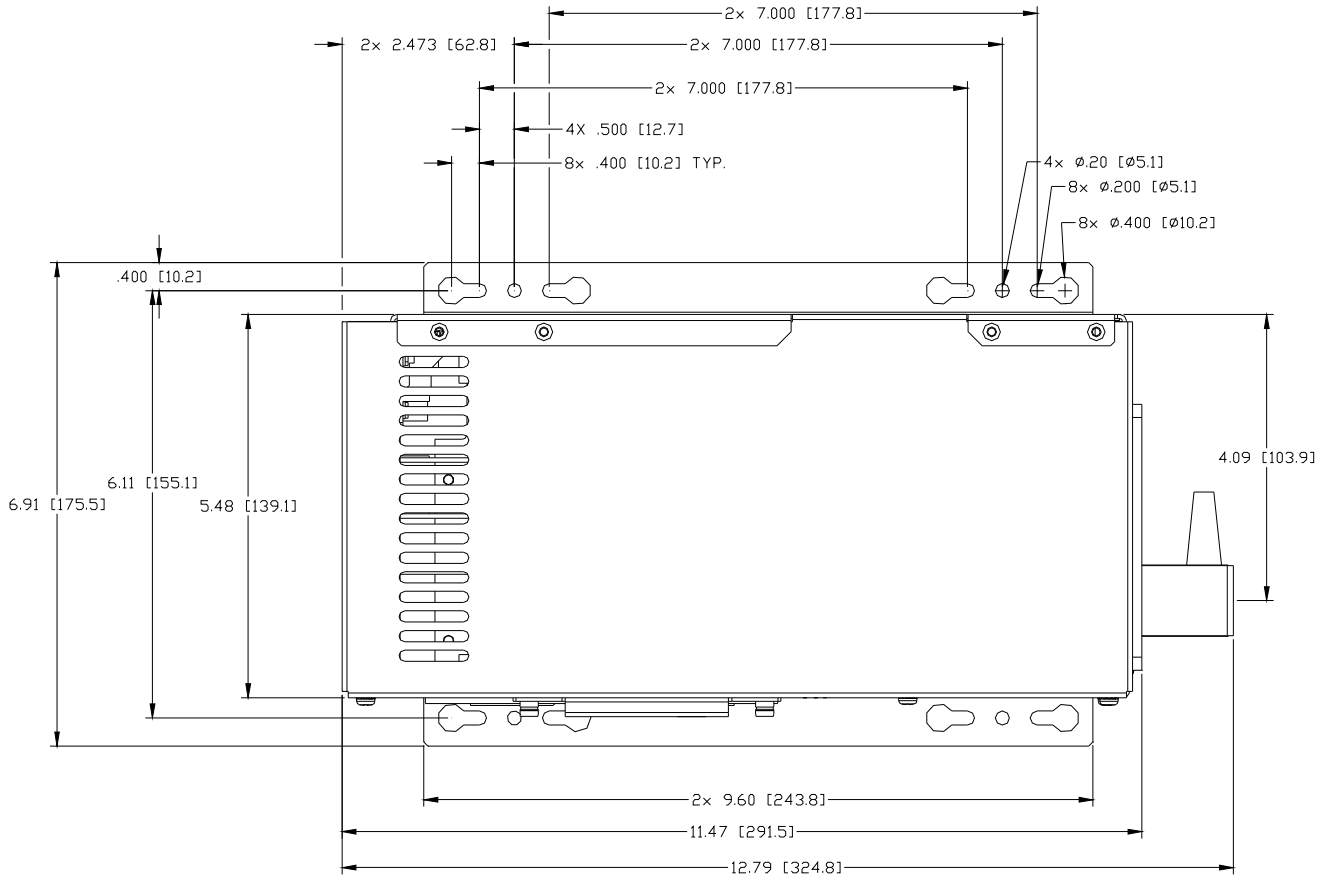
- Consider locations of accessories such as AC power outlets and lighting (interior lighting and windows) for installation and maintenance convenience
- Prevent condensation by installing a thermostat-controlled heater or air conditioner
- To allow for maximum cooling, avoid obstructing the airflow
- Place any fans or blowers close to the heat generating devices. If using a fan, make sure that outside air is not brought into the enclosure unless a fabric or other reliable filter is used. This filtration prevents conductive particles and other harmful contaminants from entering the enclosure.
- Do not select a location near equipment that generates excessive electromagnetic interference (EMI) or radio frequency interface (RFI). Examples of these types of equipment are: high power welding machines; induction heating equipment; and large motor starters.
- Place incoming power line devices (such as isolation or constant voltage transformers, local power disconnects, and surge suppressers) away from the system. The proper location of incoming line devices keeps power wire runs as short as possible and minimizes electrical noise transmitted to the unit.
- Make sure the location does not exceed the unit's shock, vibration, and temperature specifications
- Install the unit in the rack or panel in such a way as to ensure that it does not cause a hazard from uneven mechanical loading
- Incorporate a readily-accessible disconnect device in the fixed wiring on permanently connected equipment
- Avoid circuit overloading of the supply circuit

System Mounting Dimensions

This section contains the mounting dimensions for the 1546 and 1547 Node Boxes.

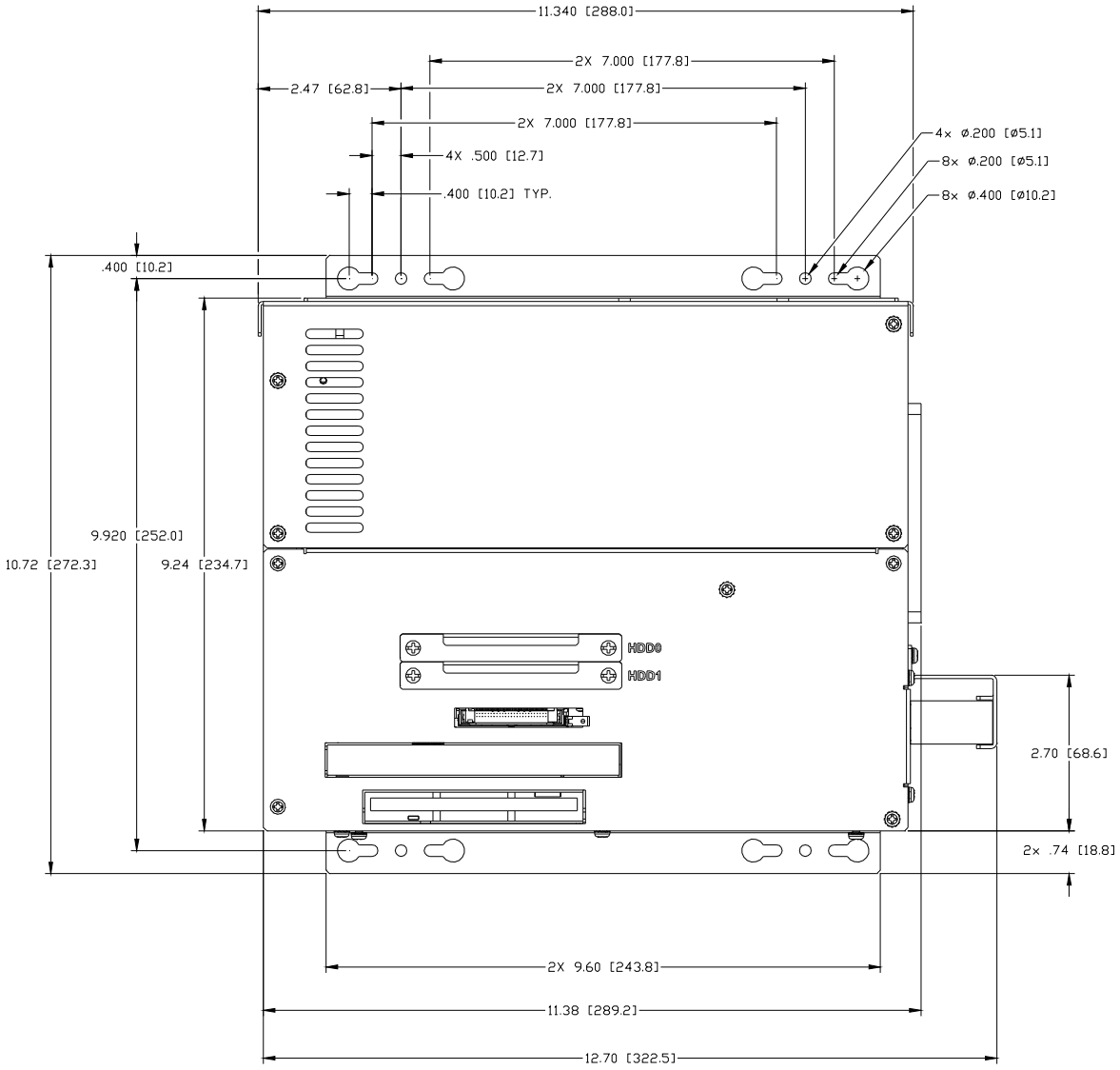
1546 Mounting Dimensions

Figure 2-1 shows the vertical mounting dimensions for the 1546 Node Box; Figure 2-2 shows the horizontal mounting dimensions for the 1546 Node Box.



All dimensions in inches (mm)

Figure 2-1. 1546 Vertical Mounting Dimensions (with mounting rails attached)

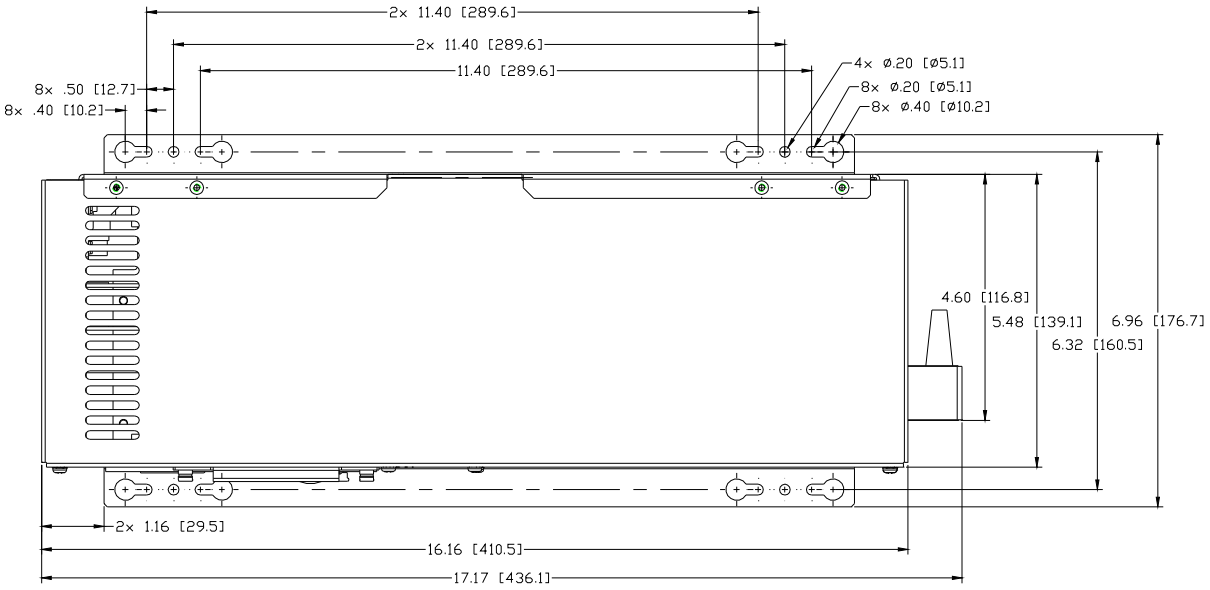


All dimensions in inches (mm)

Figure 2-2. 1546 Horizontal Mounting Dimensions

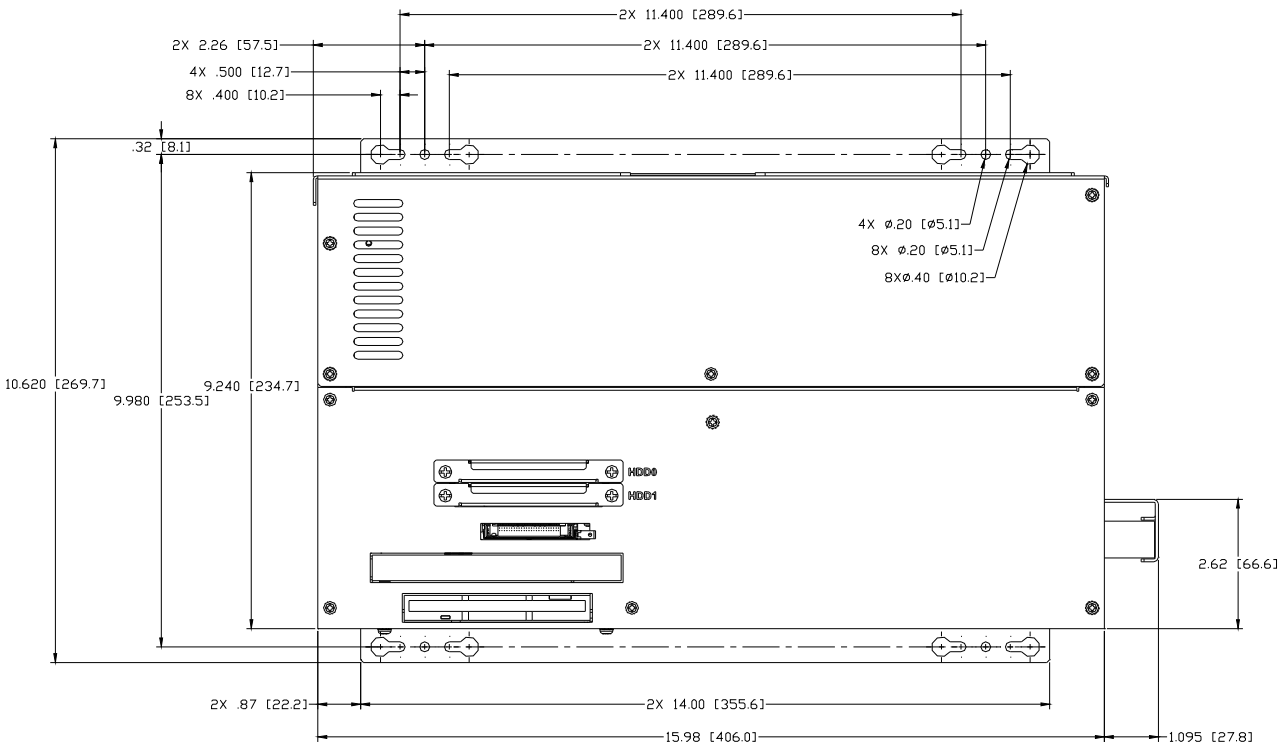
1547 Mounting Dimensions

Figure 2-3 shows the vertical mounting dimensions for the 1547 Node Box; Figure 2-4 shows the horizontal mounting dimension for the 1547 Node Box.



All dimensions in inches (mm)

Figure 2-3. 1547 Vertical Mounting Dimensions



All dimensions in inches (mm)

Figure 2-4. 1547 Horizontal Mounting Dimensions

Power Management

The following paragraphs explain the system power, the power supply, and the effects of excessive heat, electrical noise, and line voltage variation of the 1546 and 1547 Node Boxes.

System Power

Using isolation transformers on the incoming AC power line to the system is always a good practice. An isolation transformer is especially desirable in cases in which heavy equipment is likely to introduce noise onto the AC line.

The isolation transformer can also serve as a step-down transformer to reduce the incoming line voltage to a desired level. The transformer should have a sufficient power rating (units of volt-amperes) to supply the load adequately.

Proper grounding is essential to all safe electrical installations. Refer to the relevant Federal, State/Provincial, and local electric codes, which provide data such as the size and types of conductors, color codes and connections necessary for safe grounding of electrical components. The code specifies that a grounding path must be permanent (no solder), continuous, and able to safely conduct the ground-fault current in the system with minimal impedance (minimum wire required is #18 AWG, 1 mm).

Observe the following practices:

- Separate ground wires (P.E. or Protective Earth) from power wires at the point of entry to the enclosure. To minimize the ground wire length within the enclosure, locate the ground reference point near the point of entry for the plant power supply.
- All electrical racks or chassis and machine elements should be Earth Grounded in installations where high levels of electrical noise can be expected. The rack/chassis should be grounded with a ground rod or attached to nearby Earth structure such as a steel support beam. Each different apparatus should be connected to a single Earth Ground point in a “star” configuration with low impedance cable. Scrape away paint and other nonconductive material from the area where a chassis makes contact with the enclosure.
- In addition to the ground connection made through the mounting bolt or stud, use a one-inch metal braid or size #8 AWG wire to connect between each chassis and the enclosure at the mounting bolt or stud.

1546 Power Supply

The 1546 node box has a 250-watt AC power supply with available expansion power. The expansion power is limited as shown in Table 2-1.

Table 2-1. 1546 Available Expansion Current

Voltage	Available Current
+3.3 VDC	4.0A
+5.0 VDC	4.0A
-5.0 VDC	160mA
+12.0 VDC	3A
-12.0 VDC	240mA

1547 Power Supply

The 1547 node box has a 250-watt AC power supply with available expansion power. The expansion power is limited as shown in **Error! Reference source not found.**.

Table 2-2. 1547 Available Expansion Current

Voltage	Available Current
+3.3 VDC	4.0A
+5.0 VDC	4.0A
-5.0 VDC	160mA
+12.0 VDC	3A
-12.0 VDC	240mA

Excessive Heat

The units withstand temperatures from 0º to 50ºC, and are fan-cooled. To keep the temperature in range, the cooling air at the base of the system must not exceed 50°C. Allocate proper spacing between internal components installed in the enclosure.

Electrical Noise

Electrical noise is seldom responsible for damaging components, unless extremely high energy or high voltage levels are present. However, noise can cause temporary malfunctions, which can result in hazardous machine operation in certain applications. Noise may be present only at certain times, may appear at widespread intervals, or in some cases may exist continuously.

Noise commonly enters through input, output, and power supply lines and may also be coupled through the capacitance between these lines and noise signal carrier lines. This usually results from the presence of high voltage or long, close-spaced conductors. When control lines are closely spaced with lines carrying large currents, the coupling of magnetic fields can also occur. Use shielded cables to help minimize noise. Potential noise generators include switching components, relays, solenoids, motors, and motor starters.

Refer to the relevant Federal, State/Provincial, and local electric codes, which provide data such as the size and types of conductors, color codes and connections necessary for safe grounding of electrical components. It is recommended that the high voltage and low voltage cabling be separated and dressed apart. In particular, the AC cables and switch wiring should not be in the same conduit with all communication cables.

Line Voltage Variation

The unit's power supply is built to operate with an input voltage range of 100-240VAC, while still allowing the system to function within its operating margin. As long as the incoming voltage is adequate, the power supply provides all the logic voltages necessary to support the processor, memory, and I/O.

In cases in which the installation is subject to unusual AC line variations, use a constant voltage transformer to prevent the system from shutting down too often. However, a first step toward the solution of the line variations is to correct any possible feed problem in the distribution system. If this correction does not solve the problem, use a constant voltage transformer.

The constant voltage transformer stabilizes the input voltage to the 1546 and 1547 units by compensating for voltage changes at the primary in order to maintain a steady voltage at the secondary. When using a constant voltage transformer, check that the power rating is sufficient to supply the unit.

AC Power Cable

A power cable must be created to supply power to the unit. The following materials are needed:

- A three-position power connector (supplied)
- A braid/foil shielded power cable, terminated at power source end, with three #18 (1.0 mm), #16 (1.3 mm), or #14 (1.6 mm) AWG solid or stranded copper wires, rated 80ºC or better

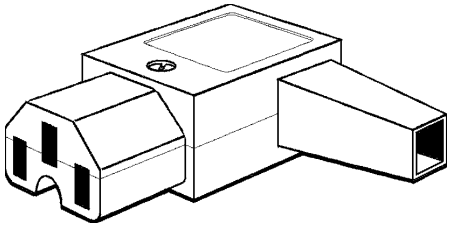


Figure 2-5. 1546/1547 AC Power Connector.

Perform the following steps to construct and attach the cable:

1. Cut wire cable to the desired length.
2. Strip 0.25-inch (6 mm) of insulation from the end of the conductor wire. No bare wire should be exposed when the cable is connected to the workstation.
3. Tin the wire ends with solder if using stranded wire. This will keep the wire from fraying.

Warning

When inserting the wire ends of the power cable into the block plug, be sure there is no exposed wire. Trim the wire ends of the cable or cut a new cable if necessary.

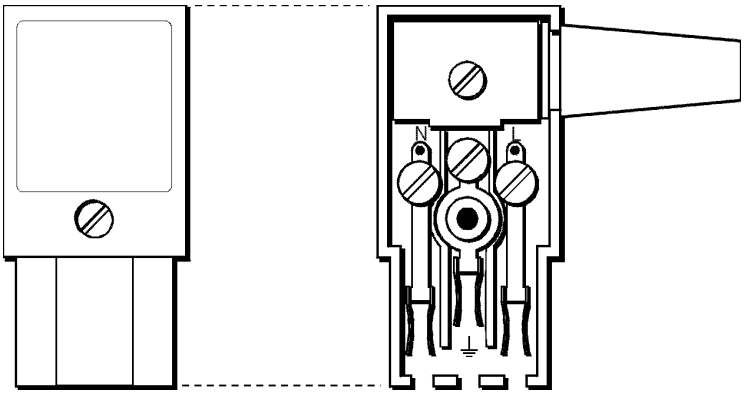


Figure 2-6. Internal View of 1546/1547 AC Power Connector

4. Insert the three wire ends of the power cable into the hole of the connector plug. Bend the Protective Earth ground (PE) wire, the neutral (N) wire, and the line (L) wire around the corresponding screw. Be sure that no bare wires are exposed.

5. Tighten the three screws above the wires to hold them firmly in place.

Warning

Never tighten the three screws of the block plug when the cable is connected to a power source. The screws are conductive and have full contact with the cable wire.

6. Use the screw provided to secure and strain-relief the power cable inside the connector. Plug the power cable into the power supply located on the side of the unit. Install the plug retainer bracket over the plug (mandatory for hazardous location installations).

7. Once the power cable and other optional interface cables are installed, installation is complete.

Note

When disconnecting the power cord from the unit, be sure to completely loosen the two securing screws on the retainer bracket.

Installing Internal Hardware Options

Remove the lid to install internal hardware options.

> **Caution**
>
> Turn off the unit before installing internal hardware.

> **Warning**
>
> Installation of expansion boards may void safety and/or EMC compliance.

DRAM and Additional DRAM Dual Inline Memory Modules DIMMs)

You can order the 1546/1547 system CPU factory-configured for many configurations of DRAM. The system has two 240-pin DDR2 DIMMs that support 512, 1GB and 2GB options. The maximum amount supported is 2GB. You can reconfigure the DDR2 capacity by changing the DDR2 DIMMs on your board.

PC/AT® and PCI Boards

1. Check the memory and I/O configuration of the board you want to install so that it does not conflict with the CPU and I/O memory maps in your AIM4 documentation.
2. Remove the lid.
3. Remove the ORB screw from the desired slot.
4. Slide the PC/AT expansion board into the corresponding rail.
5. Push the board into the backplane connectors.

> **Caution**
>
> **DO NOT** force the boards or apply uneven pressure.

> **Caution**
>
> Make sure boards do not exceed the power limitations of the 1546 and/or 1547. Refer to tables 2–1 and 2–2.

6. Secure the board by installing the screw through the hole in the board's metal ORB and into the top of the track.
7. Replace the lid.

Hazardous Locations Installation

Pro-face designed the 1546 and 1547 Node Box Industrial PCs to meet the requirements of Class I, Division 2 Hazardous Locations applications. Division 2 locations are those locations that are normally non-hazardous, but could become hazardous due to accidents that may expose the area to flammable vapors, gases or combustible dusts.

These systems have been designed as non-incendiary devices. They are not intrinsically safe and should never be operated within a Division 1 (normally hazardous) location when installed as described here. Nor should any peripheral interface device attached to these systems be located within Division 1 locations unless approved and/or certified diode barriers are placed in series with each individual signal and DC power line. Any such installations are beyond the bounds of Pro-face design intent. Pro-face accepts no responsibility for installations of this equipment or any devices attached to this equipment in Division 1 locations.

Note

When additional cards are added, it is the customer's responsibility to ensure that the cards chosen meet operating conditions for Class I and II, Division 2 Hazardous Locations. Additions and/or modifications without express consent from UL and/or Pro-face will void Hazardous Locations compliance.

It is the responsibility of the customer to ensure that the product is properly rated for the location. If the intended location does not presently have a Class, Division, and Group rating, then users should consult the appropriate authorities having jurisdiction in order to determine the correct rating for that Hazardous Location.

In accordance with Federal, State/Provincial, and Local regulations, all hazardous locations installations should be inspected by the appropriate authority having jurisdiction prior to use. Only technically qualified personnel should install, service, and inspect these systems.

Warning

In order to maintain a safe condition, do not use an external keyboard or mouse when the unit is operating in a hazardous environment.

Safety Agency Approval

The Pro-face systems have the following approvals:

- *Underwriters Laboratories Inc., UL 1604 Standard for Safety.* Electrical equipment for use in Class I and Class II, Division 2, and Class III hazardous (classified) locations (UL Listed, File E180970)
- *Underwriters Laboratories Inc., UL 508,* "Industrial Control Equipment" (UL Listed, File E107636)

- *Canadian Standard Association, Specification C22.2 No. 213-M1987.* Non-incendiary electrical equipment for use in Class I, Division 2 Hazardous Locations (cUL Listed, File E180970)
- Canadian Standards Association, Specification C22.2 No. 142, (cUL Listed, File E107636)

Warning

Suitable for use in Class I, Division 2 Groups A, B, C, and D hazardous locations or non-hazardous locations only.

Warning – Explosion Hazard

Substitution of components may impair suitability for Class I, Division 2.

Avertissement – Risque d'Explosion

La substitution de composants peut rendre ce materiel inacceptable pour les emplamements de classe I, Division 2.

Warning – Explosion Hazard

Do not disconnect equipment unless the power has been switched off or the area is known to be non-hazardous.

Avertissement – Risque d'Explosion

Avant de deconnecter l'equipment, coupler le courant ou s'assurer que l'emplacement est designe non dangereux.

Warning – Explosion Hazard

When in hazardous locations, turn off power before replacing or wiring modules.

Avertissement – Risque d'Explosion

Dans les situations hasardees, couper la courant avant de remplacer ou de cabler les modules.

Definitions

The following Class and Division explanations are derived from Article 500 (Sections 5 and 6) of the United States National Fire Protection Agency National Electric Code (NFPA 70, 1990). They are not complete and are included here only for a general description for those not familiar with generic hazardous locations' requirements.

Persons responsible for the installation of this equipment in Hazardous Locations are responsible for ensuring that all relevant codes and regulations related to location rating, enclosure, and wiring are met.

Class I Locations

Class I locations are those in which flammable gases or vapors are or may be present in the air in quantities sufficient to produce explosive or ignitable mixtures.

Class II Locations

Class II locations are those that are, or may become, hazardous because of the presence of combustible dust.

Division 1 Locations

A Division 1 location is one in which flammable or ignitable gasses, vapors, or combustible dusts and particles can exist due the following conditions:

- Normal operating conditions;
- Because of repair, maintenance conditions, leakage, or mechanical failure or abnormal operation of machinery or equipment; or
- Combustible dusts of an electrically conductive nature may be present in hazardous quantities.

Note

Pro-face systems are not suitable for installation within Division 1 locations.

Note

Electrical equipment cannot be installed in Division 1 locations unless they are intrinsically safe, installed inside approved explosion-proof enclosures, or installed inside approved purged and pressurized enclosures.

Division 2 Locations

Division 2 locations are listed below:

- Class I volatile flammable liquids or flammable gasses are handled, processed, or used, but confined within closed containers or closed systems from which they can escape only in cases of accidental rupture or breakdown of such enclosures or systems, or in case of abnormal operation of equipment.
- Ignitable concentrations of Class I vapors or gasses are normally prevented by positive mechanical ventilation, but which may become hazardous due to mechanical failure of those ventilation systems.
- Location is adjacent to a Division 1 location.
- Class II combustible dust is not normally in the air in quantities sufficient to produce explosive or ignitable mixtures. Dust accumulations are normally insufficient to interfere with normal operation of electrical equipment or other apparatus. Combustible dust may be in suspension in the air as a result of the following: malfunctioning of handling or processing equipment; combustible dust accumulations on, or in the vicinity of electrical equipment; may be ignitable by abnormal operation or failure of electrical equipment.

Groups

All electrical equipment that is approved for use in hazardous locations must include a group rating. Various flammable and combustible substances are divided into these groups as a function of their individual maximum experimental safe gap (MESG), explosion pressure, and ignition temperature.

Component temperatures and the potential for spark based upon voltage, current, and circuit characteristics, within electrical equipment, will determine what the equipment group rating will be. A device approved for installation within Class I, Group A locations may also be used in Groups B, C, or D.

Note

Approved Class I equipment may not be suitable for Class II installations. Class I includes Groups A, B, C, and D. Class II includes Groups F, and G.

Enclosures

The systems are designed for installation within a clean and dry enclosure for both ordinary and hazardous locations. The enclosure used for Class I hazardous locations should have a minimum rating of Type 12 (NEMA 12, IP 5X). However, Type 4 (IP 6X) enclosures are strongly recommended.

The requirements for enclosure fittings, conduit, and wiring vary according to the specific rating of the location and the type of flammable or combustible material involved. Those requirements are beyond the scope of this document and it is the responsibility of the customer to ensure that their installation is compliant with

codes and regulations that apply to their specific location. Reference NFPA 70, Article 500 for specific regulations in the United States.

Power Switch

The 1546 and 1547 systems do not have a power switch. The amount of input power required by these systems classifies the power switch as an incendiary device because the voltage and current across the make/break device are capable of creating a spark.

Hazardous locations' regulations require that a power switch rated for ordinary locations may be used if it is located in an area specified as non-hazardous. However, limits in cable length between the workstation and the power switch may apply. Otherwise the switch must be compliant with Class I, Division 1 requirements (intrinsically safe). These switches are built in a manner that prevents the possibility of a spark when contacts are made or broken.

Use suitable UL listed and/or CSA Certified Class I, Division 1 switches in hazardous locations. These switches are available from a wide number of sources. It is the responsibility of the customer to ensure that the power switch selected for their installation has the correct hazardous locations rating for the location in which it is installed.

Cable Connections

Division 2 hazardous location regulations require that all cable connections be provided with adequate strain relief and positive interlock. Never connect or disconnect a cable while power is applied at either end of the cable.

Communication Cable Interface

All communication cables should include a chassis ground shield. This shield should include both copper braid and aluminum foil. The D-sub style connector housing should be a metal conductive type (e.g., molded zinc) and the ground shield braid should be well terminated directly to the connector housing. Do not use a shield drain wire.

The outer diameter of the cable must be suited to the inner diameter of the cable connector strain relief in order to ensure that a reliable degree of strain relief is maintained. Always secure the D-Sub connectors to the workstation mating connectors via the two screws located on both sides.

Warning

Never connect or disconnect the communication cables while power is applied at either end of the cable. This may result in an incendiary spark. Permanent damage to the workstation communication components may occur.

Operation and Maintenance

The systems have been designed for compliance with relevant spark ignition tests. However, please note that the workstation front panel contrast adjustment tactile switches and keyboard connector are the only make/break components intended to be exercised by the operator in the course of normal operation.

> **Warning**
>
> In order to maintain a safe condition, never use an external keyboard or mouse when the unit is operating in the presence of a hazardous environment.

With respect to Hazardous Location installations, always observe the following rules:

1. Always install the 1546 or 1547 within an enclosure suitable for the specific application. Type 4 (IP 65) enclosures are recommended even when not required by regulations.
2. If present, keep enclosure doors or openings closed at all times, to avoid the accumulation of foreign matter inside the workstation.
3. Never subject the unit to any installation or service procedures unless power has been removed and the area is known to be non-hazardous. This includes the installation or removal of power cables, communication cables, or removal of the rear cover of the unit.
4. Only technically qualified service personnel should perform all installation and service. These workstations are designed to require no service in the course of normal operation by an operator.

Chapter 3 – Maintenance

The 1546 and 1547 systems are designed to withstand the harsh environment of the factory floor. Routine maintenance can help keep your system in good operating condition. Preventive maintenance consists of several basic procedures that will greatly reduce the chance of system malfunction. Schedule preventive maintenance along with the regular equipment maintenance to minimize down time.

General Preventive Maintenance

Here are some preventive measures you can take:

- *Clean or change the fan filter periodically* to ensure that the air circulating in the unit is clean. Wash the filter with warm water and dish soap, and let it air dry. Do not scrub the filter, and do not reinstall it into the unit until it is completely dry.
- *Base your maintenance schedule* on the type of environment the system is in (i.e., if the area is dusty, you should schedule maintenance more often than if it is a dry, clean area). Check the filter often to determine if it needs to be changed ahead of schedule.
- *Remove dust and dirt from PC components*. If dust builds up on heat sinks and circuitry, an obstruction of heat dissipation could cause the unit to malfunction. If dust reaches the electronic boards, a short circuit could occur.
- *Check the connections to I/O modules,* especially in environments where vibration could loosen the connections. Check to see that all plugs, sockets, terminal strips, and module connections are solid.
- *Remove unnecessary articles, such as drawings or manuals, from the unit.* They can obstruct airflow and create hot spots, which cause the system to malfunction.
- Do not place noise-generating equipment near the 1546 or 1547 unit.

Fuse Replacement

The 1546 and 1547 units have no accessible fuse. Return the unit to the factory for fuse replacement.

Fan Filter Replacement

To change the fan filter, remove the grill and filter as illustrated in Figure 3-1 and replace the filter. Then snap the assembly back into position.

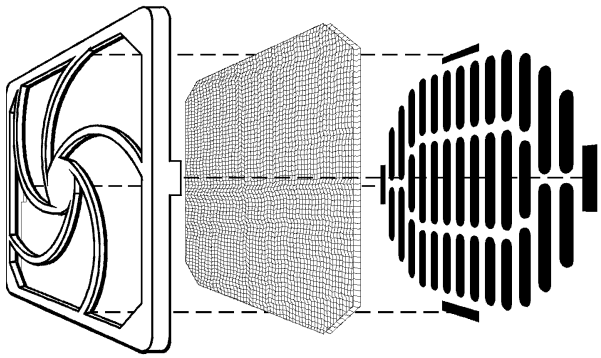


Figure 3-1. Fan Assembly

Caution

Do not operate the 1546 or 1547 without a fan filter. Dust build-up could cause the unit to malfunction.

Recommended Hard Drive Preventive Maintenance

Pro-face has recognized that hard drive failures may begin to increase an average of four to five years into the life of most computers used in industrial applications. Therefore, it is our recommendation as a preventive maintenance measure that all hard drives used in these types of applications be replaced before the four to five year time period to avoid any down time related to hard drive failure.

Pro-face believes it is important to keep our customers informed, to offer alternative solutions, and to provide all of our customers with the excellent service they deserve.

Any questions regarding this issue may be directed to our support center at *support@profaceamerica.com*.

Note

Pro-face recommends frequent backups of your hard drive, especially before beginning preventive maintenance procedures.

System Battery Replacement

The 1547/1547 AIM4 CPU board includes a coin cell type lithium battery that maintains computer configuration, date, and time information when input power is removed from the system.

If the AIM4 CPU board battery life is ended then the 1546/1547 computer will no longer maintain the configuration information, date, or time and the battery will need to be replaced. In this case, the following types of error messages will be displayed on the screen at start-up time:

```
ERROR
0271: Check Date and Time Settings
Warning
0251: System CMOS Checksum Bad – Default Configuration
Used

Press <F1> to Resume, <F2> to Setup
```

BATTERY SPECIFICATIONS:

Part Number:	CR2032
Voltage:	3 V
Nominal Capacity:	220 mAh

This battery must be a UL Recognized component.

BATTERY LIFETIME:

Battery current is not consumed while input power is applied to the AIM4 CPU board. However, electrolyte loss through the crimp seal will typically occur at the rate of approximately 0.5% per year at 20 degrees C (68 F). This rate will increase with higher temperatures.

The AIM4 CPU board will consume approximately 6 uA of battery current when power is removed from the motherboard. At this rate, the battery will last approximately 4.2 years in storage at 21 degrees C (70 F). This represents 100% duty cycle, or 'input power off time'. Example:

Battery Capacity = 220 mAh
IC Current Drain = 6 uA
Battery lifetime = (0.22 aH)/6 X 10^{-6} = 36,666 hours = 4.2 years.

When input power is off at the rate of 12 hours per day continuously the battery life should be approximately double the 100% duty cycle time, or 8.4 years at 21 degrees C (50% duty cycle). When input power is off at the rate of 16 hours per day the lifetime should be approximately 12.6 years (33%) duty cycle. However, the electrolyte loss through the crimp seal may reduce the 33% duty cycle lifetime somewhat.

Battery lifetime is inversely proportional to the temperature of the battery. At elevated temperatures the battery life will be decreased.

BATTERY REMOVAL:

Caution

There is danger of the new battery exploding if it is incorrectly installed. Only technically qualified personnel should perform battery replacement and disposal. Please note the disposal instructions as described in this section.

Please refer to Figure B-1 in Appendix B, 'AIM4 CPU Board Layout'. The lithium battery is identified by the 'BT1' designation.

TOOLS REQUIRED:

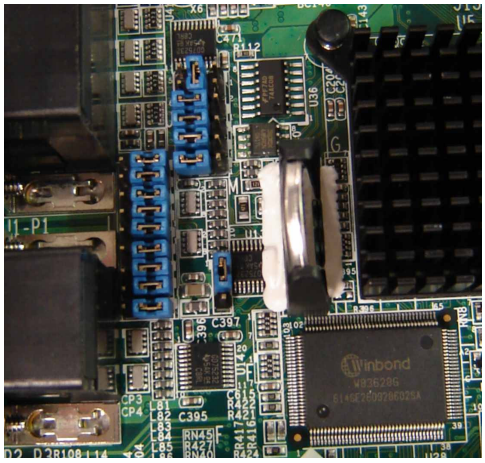
1. Long Philips Screwdriver for #6 philips screws and captive screw
2. Electrical tape to tape the old battery after removal
3. QWERTY keyboard to restore CMOS memory settings after replacing the lithium battery

ESD WARNING!

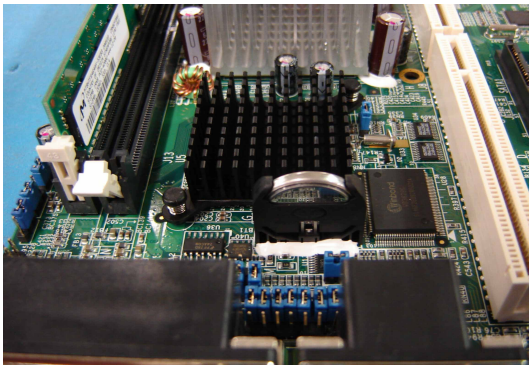
Protective measures against electrostatic discharge (ESD) must be taken when working inside of any computer. Failure to do so may result in permanent damage to electrical components within. This damage may be immediate or latent (final computer failure may occur at a later date). Be sure to make consistent 'skin to metal' contact with the computer chassis when making contact with any electrical assemblies or components.

TO GAIN ACCESS TO THE BATTERY AND REPLACE:

1. Remove power from the 1546/1547 computer. If installed in a panel the computer must be removed and placed screen down on a bench. To work on the computer on the bench you must first place a soft clean cloth on the clean surface of the bench in order to prevent scratches to the display overlay or touch screen. If the computer includes a front panel mouse, then be sure to prop up the bottom edge of the front panel with a soft object in order to prevent damage to the panel mouse controller. Do not rest the face of the computer on the mouse controller.
2. Remove the top cover of the rear chassis (1546: four #6 screws, 1547: five #6 screws)
3. Locate the battery holder and remove the coin cell battery:



4. Immediately apply electrical tape to the old battery on all sides in order to prevent shorting the battery. The battery may still have charge and a short may cause fire or explosion. Do not dispose of the battery with standard waste. Contact your local waste disposal agency for the address of the nearest battery deposit site.
5. Install the new battery as indicated below. Note position of '+' sign.



TO RE-ASSEMBLE THE 1546/1547 COMPUTER:

1. Install the rear chassis top cover (1546: four #6 screws, 1547: five #6 screws).

TO SETUP THE CMOS MEMORY:

1. Plug a QWERTY keyboard into the Keyboard port on the side of the 1546/1547 computer
2. Apply power to the 1546/1547 computer. The same ERROR and WARNING messages should appear as before battery replacement. This is because the CMOS memory must be setup:

```
ERROR
0271: Check Date and Time Settings
Warning
0251: System CMOS Checksum Bad - Default
Configuration Used

Press <F1> to Resume, <F2> to Setup
```

3. Press the QWERTY keyboard F2 function key to enter CMOS Memory SETUP

4. The SYSTEM TIME and SYSTEM DATE fields are located at the top of the MAIN tab screen. Use the UP and DOWN arrow keys on the keyboard to move from field to field. Use the TAB key to move between the [HH:MM:SS] and [MM/DD/YYYY] sub-fields to enter the present time and date.
5. Press the QWERTY keyboard F10 function key to SAVE AND EXIT.
6. Lithium battery replacement is now complete. The computer should boot with no error or warning messages.

Product Repair Program

Pro-face's Product Repair & Customization Department (PR&C) restores equipment to normal operating condition and implements engineering changes that enhance operating specifications. Pro-face tests products returned to Pro-face with the standard Pro-face test diagnostics.

Follow the steps below to prepare the unit for shipment:

1. Obtain an Return Merchandise Authorization (RMA) number for your unit by visiting the Pro-face RMA Request web page and fill out the online request form:

   http://www.profaceamerica.com//rma//

   If you cannot fill out the online form, there is an RMA Request Form Document that can be downloaded and either E-mailed (*support@profaceamerica.com*) or Faxed (734-429-1010) to the Pro-face Customer Support Team.

   If you have difficulty then please call the Pro-face Customer Support Team at (734) 944-0482).

2. Please have the following information:
   - Company name, shipping and billing address
   - Type of service desired: product repair or product exchange
   - Product model number, part number, quantity, serial number(s), and warranty status
   - Failure mode and failure systems
   - Purchase order number or repair order number
3. Make sure the front panel assembly is properly attached to the unit.
4. Attach failure information to the unit to speed processing.
5. Place the unit securely in its original packaging or an equivalent heavy-duty box.
6. Mark the RMA number on your purchase order and on the outside of the box.
7. Send the unit to the address given when you receive your RMA number.

Chapter 4 – Troubleshooting

Diagnostic Testing

If you suspect that you are having hardware problems with your 1546 or 1547 system, you can use the Pro-face/Xycom diagnostic utility to check out the PC's various ports and subsystems. The diagnostic utility is on the Documentation and Support Library CD included with your unit.

Create Diagnostic Disk

The first task is to create a diagnostic diskette. The following steps can be done on any computer with a CD-ROM drive and a floppy drive:

1. Create a DOS-bootable diskette.
2. Create a temporary folder on the computer hard drive.
3. There is a self-extracting zip file on the Documentation and Support Library CD located in:

   DRIVERS\Computer Diagnostics 99290-001\DOS\xydiag

   Run that program and extract the files to the temporary folder you just created.
4. Copy the extracted files onto the DOS-bootable diskette. This diskette will be inserted directly into the unit's floppy drive.

Prepare the System

Before starting the system tests, perform the following steps:

1. Place the CPU board jumpers and switches to the factory set positions. Refer to Appendix for details.
2. Plug the female end of the AC power cable into the side of the unit and the male end into a properly grounded outlet.
3. Connect the serial loopback connector(s) and the printer cable to the appropriate connectors, and connect a PC/AT or PS/2 keyboard. Figure 4-1 illustrates the wiring necessary for the loopback connection.
4. Default the CMOS setup to the factory settings.

After completing all of the preceding steps, the unit is ready for diagnostic testing. Follow the directions in the Running the Tests section of this chapter.

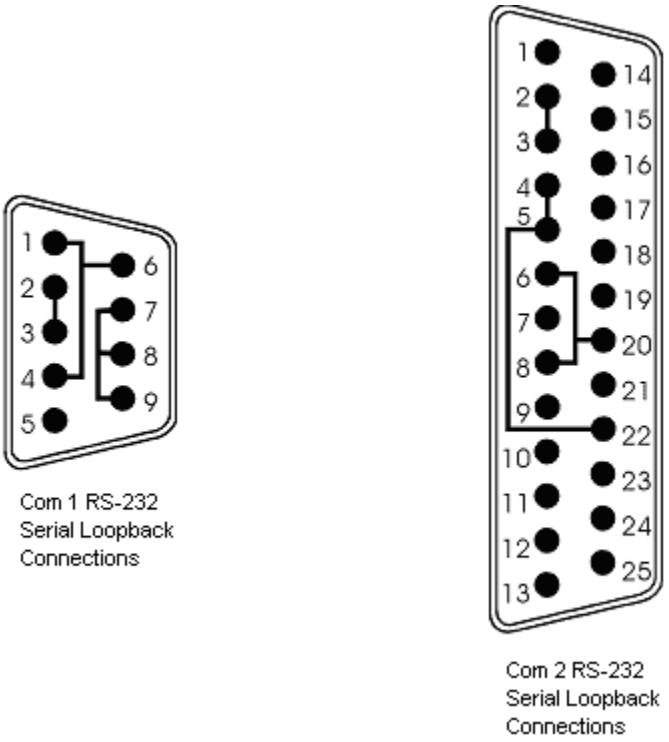


Figure 4-1. Serial Loopback Connections

Running the Tests

To run the test, insert the diagnostics disk into drive A. Turn on the computer (the diagnostics program will boot-up). Figure 4-2 shows the Main Menu.

```
          Copyright xxxx, <Company Name> All rights reserved.
          Diagnostic Tests Sequence/Selection Menu (Rel. xx)
1. WILL pause on error              5. Auto-select tests
2. SINGLE PASS test mode            6. Deselect all tests
3. Save setup to file               7. Quit and exit to DOS
4. Extract setup from a file        8. Return to previous screen

A) RAM Test                         K) Video Interface Test
B) Video RAM Test                   L) Speaker Port Test
C) Extended RAM Test                M) LPT1: Printer Port Test
D) Real Time Clock Test             N) LPT2: Printer Port Test
E) COM1 Serial Port Test            O) C: Hard Drive Interface Test
F) COM2 Serial Port Test            P) D: Hard Drive Interface Test
G) COM3 Serial Port Test            Q) A: Floppy Drive Interface Test
H) COM4 Serial Port Test            R) B: Floppy Drive Interface Test
I) Math Coprocessor Test            S) Keyboard, Keypad Tests
J) Video Adjustments Test             ≡ = Test Selected

                    [ENTER]=START TESTING
Use the letters to move the cursor and select/deselect, or use the arrow
keys to move, then use the [SPACE] key to select/deselect a test or
function.
```

Figure 4-2. Main Menu

Note

Please read the DIAG.TXT file on the diagnostics disk for detailed information about the tests.

Note

Avoid repeated running of any hard disk diagnostic utility if you use the Solid State (Flash) drive option. The Flash drive has a limited number of writes to each logical sector. Repeated writes from a diagnostic utility will prematurely shorten the life of the drive.

Reinstalling Operating Systems

The 1546 and 1547 systems ship with Windows® XP Professional. The Windows® 2000 operating system are also available. If you need to reinstall an

operating system, refer to the appropriate section below. If you want to change operating systems, you will need to use the manufacturer's instruction manual.

Note

If you need to reinstall the Windows 2000, or Windows XP Professional operating system, you must have an internal CD-ROM drive or an external parallel port CD-ROM drive. A floppy drive may also be required for loading drives when F6 is pressed during install. Windows 2K and Windows XP ship only on CD-ROM.

Windows® 2000 Reinstallation

If you need to reinstall the Windows 2000 operating system, refer to the *Pro-face/Xycom Workstation Recovery Media Software Installation Instructions for Microsoft® Windows® 2000* (shipped with systems preinstalled with Windows 2000). This document is devoted to the reinstallation of your Windows 2000 operating system and drivers utilizing the Recovery Media provided with your Pro-face/Xycom industrial computer.

Note

This procedure assumes that the computer hard disk drive has been completely corrupted or replaced.

Warning

This procedure will destroy data that may exist on the hard disk drive.

Windows XP® Reinstallation

If you need to reinstall the Windows® XP operating system, refer to the *Pro-face/Xycom Workstation Software Installation Instructions For Microsoft Windows X*P (shipped with systems preinstalled with Windows XP). This document is devoted to the reinstallation of your Windows XP operating system and drivers, utilizing the XP CD provided with your Pro-face/Xycom industrial computer. If you want to install a new operating system or reinstall a current operating system, refer to the Windows XP Professional CD-ROM (shipped with systems preinstalled with Windows XP Professional).

Note

This procedure assumes that the computer hard disk drive has been completely corrupted or replaced.

Warning

This procedure will destroy data that may exist on the hard disk drive.

If you want to install a new operating system or reinstall a current operating system, refer to the operating system's manual for directions.

Installing Drivers

This section describes how to install the drivers associated with the system.

Video Drivers

Video drivers and the expansion utilities are on the Documentation and Support Library CD included with the documentation kit.

For the AIM4 system, choose the video driver for your operating system from the following directory on the Documentation and Support Library CD:

\DRIVERS\AIM4

Note: the video driver is part of the Intel chipset

Video Expansion

This section deals with the hardware expansion capability of the video controller chip in DOS applications.

Note

It is *not* necessary to read this section if you are a Windows or OS/2® user and do not plan to run DOS applications.

Unlike a CRT monitor, a flat panel display has a fixed horizontal and vertical resolution. There are many DOS video modes whose resolution is less than that of a flat panel display. In order to more efficiently make use of the flat panel display's active area, it is necessary to employ an expansion technique, which stretches the lower resolution information to fill the higher resolution of the display.

For example, DOS defaults to VGA video mode 3+. This is an 80 column, 25-row text only screen whose effective resolution is 640 dots x 400 scan lines. Because of this, the 800 x 600 display of the system will be partially filled by the 640 x 400 resolution of this particular mode. The expansion function uses lower resolutions that will better utilize the display by stretching the information in an attempt to fill the display.

Operating systems such as Microsoft Windows XP and Windows 2K use display drivers to handle the different flat panel displays. Here, expansion is not necessary since there is a specific driver for each resolution display.

Expansion does not add any resolution to the existing information; it simply stretches the information to better fit the display. Text and graphic screens can look somewhat grainy from the process of expansion.

Miscellaneous Drivers

Refer to your operating system and peripheral manuals for information on installing drivers related to these items.

Note

If you ordered a system with Windows pre-loaded, you may have to purchase and install an external parallel port CD-ROM drive, or order your system with a CD-ROM drive pre-installed, to be able to install Windows drivers. The Windows operating system ships only on CD-ROM.

Note

For further assistance, contact Pro-face Technical Support at 734-944-0482 or support@profaceamerica.com.

Appendix A – Technical Specifications

Hardware Specifications

Table A - 1 lists the hardware specifications for the 1546 and 1547.

Table A - 1. Hardware Specifications

Characteristic	Specification	
	1546	**1547**
V. Mount. Size H. Mount Size Size Weight	12.79 x 10.72 x 6.00 12.79 x 6.91 x 9.50 12.79 x 9.24 x 5.74 14.6lbs.	17.17 x 10.62 x 6.00 17.17 x 6.96 x 9.50 17.17 x 9.24 x 5.74 19.6
Electrical AC	100-240 VAC 50-60 Hz	74 Watts Maximum, i.e. ~ 1Amp.
Power Supply	250 watts	250 watts
Passive Backplane	Four available expansion slots: one ½ length PCI two ¾ length PCI one ¾ length PCI or ISA	Four available expansion slots: one ½ length PCI two full length PCI one full length PCI or ISA
Available Power (for expansion by user)	+3.3 V 4.00A maximum +5 V 4.00A maximum –5 V 160mA maximum +12 V 3.00A maximum –12 V 240mA maximum	+3.3V 4.00A maximum +5V 4.00A maximum –5V 160mA maximum +12V 3.00A maximum –12V 240mA maximum .
Agency Approvals	UL 508 (Listed) UL 1604 (Listed) cUL CSA C22.2, No. 142 (Listed) cUL CSA C22.2, No. 213 (Listed)	
Regulatory Compliance	FCC 47 CFR, Part 15, Class A CE EMI EN55022, Class A IMMUNITY EN61000–6-2 SAFETY EN60950 HARMONICS EN61000-3-2, Class A FLICKER EN61000-3-3	

Environmental Specifications

Table A - 2 lists the environmental specifications for the 1546 and 1547.

Table A - 2. Environmental Specifications

Characteristic	Specification
Temperature	
Operating	0° to 50° C (32° to 122° F)
Non-operating	-20° to 60°C (-4° to 140°F)
Humidity	
Operating	20% to 80% RH, non-condensing
Non-operating	20% to 80% RH, non-condensing
Altitude*	
Operating	Sea level to 10,000 feet (3,048 m)
Non-operating	Sea level to 40,000 feet (12,192 m)
Vibration (5 to 2000 Hz)	
Operating**	0.006” (0.15mm) peak to peak displacement 1.0g maximum acceleration
Non-operating	0.015” (0.38mm) peak to peak displacement 2.5g maximum acceleration
Shock	
Operating**	15g peak acceleration, 11 msec duration, ½ sine wave
Non-operating	30g peak acceleration, 11 msec duration, ½ sine wave

* Consistent with internal component specifications

** These values are with solid-state hard drives and not rotating media drives.

Appendix B – AC Model Block Diagram

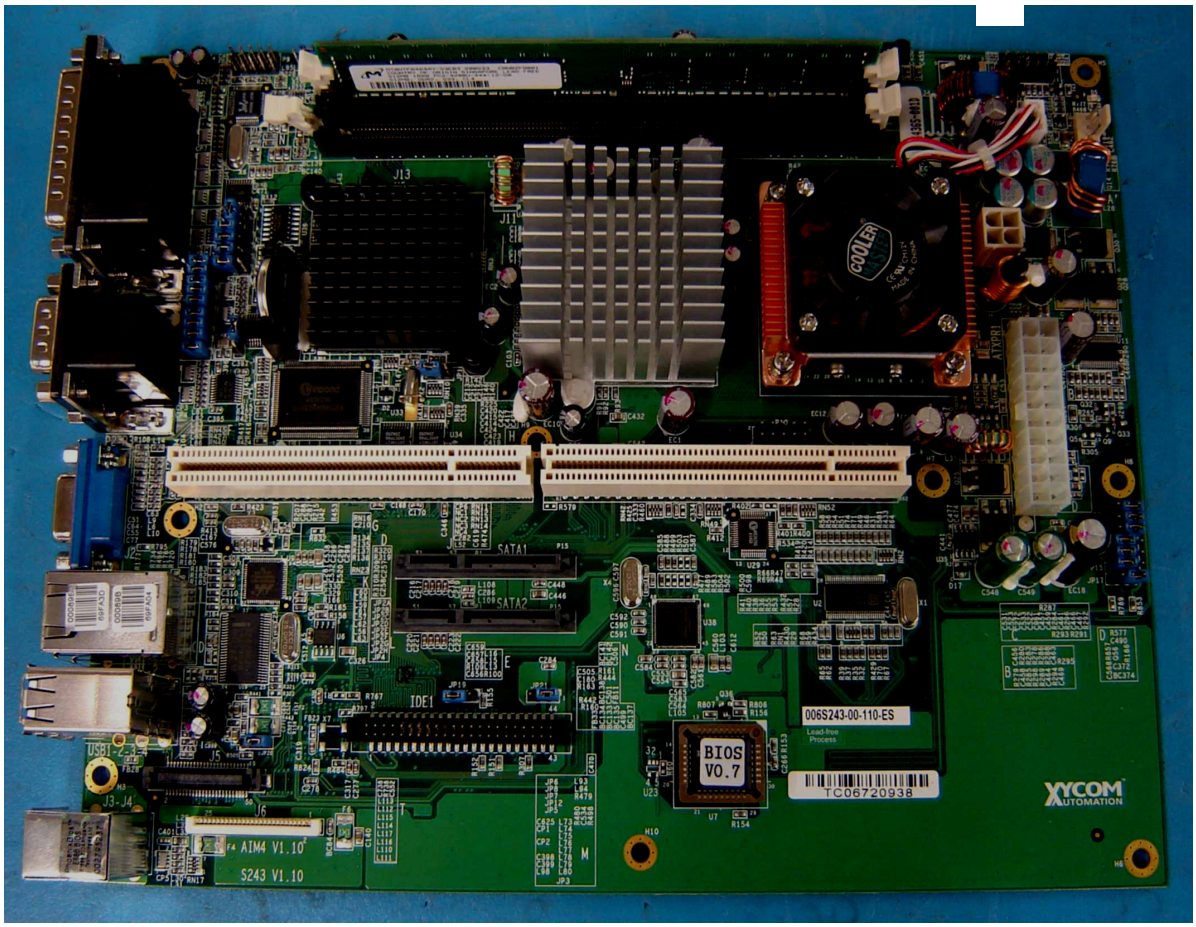


Figure B - 1. 1546/1547 System Block Diagram

Appendix C – Pinouts

This appendix provides the pinouts for the keyboard, mouse, LPT1, COM1, COM2, USB, and VGA connectors. **NC indicates No Connection**.

Keyboard Port Connector

The following table lists the signal definitions for the keyboard connector. It is a standard PS/2-compatible connector.

Table C - 1. Keyboard Connector Pinout

Pin	Signal
1A	KB_DATA
2A	NC
3A	GND
4A	5VFUSE
5A	KB_CLK
6A	NC

Mouse Port Connector

The following table lists the signal definitions for the PS/2 mini-DIN mouse port connector.

Table C - 2. Mouse Connector Pinout

Pin	Signal
1B	MOUSE_DATA
2B	NC
3B	GND
4B	5VFUSE
5B	MOUSE_CLK
6B	NC

Four USB Connector (USB1)

The following table lists the signal definitions for each of the four USB connectors.

Table C - 3. Four USB Pinout

Pin	Description
1	5VFUSE
2	USBP0–
3	USBP0+
4	GND

Parallel Port Connector (LPT1)

The following table shows the signal definitions for the DB-25 Parallel port connector.

Table C - 4. Parallel Connector Pinout

Pin	Signal
1	STROBE
2	PD(0)
3	PD(1)
4	PD(2)
5	PD(3)
6	PD(4)
7	PD(5)
8	PD(6)
9	PD(7)
10	PACK
11	PBUSY
12	PE
13	SELECT

Pin	Signal
14	AUTOFEED
15	PERROR
16	INIT
17	SELIN
18	GND
19	GND
20	GND
21	GND
22	GND
23	GND
24	GND
25	GND

Serial Port Connectors

RS-232, RS-422 and RS-485 are supported by AIM4.

COM1

The following table lists the signal definitions for the COM1 DB-9 connector.

Table C - 5. COM1 Connector Pinout

RS-232		RS-422		RS-485	
Pin	**Signal**	**Pin**	**Signal**	**Pin**	**Signal**
1	DCD1	1	TXD- (note 1)	1	DATA- (note 1)
2	RXD1	2	TXD+ (note 1)	2	DATA+ (note 1)
3	TXD1	3	NC	3	NC
4	DTR1	4	NC	4	NC
5	GND	5	GND	5	GND
6	DSR1	6	RXD-	6	NC
7	RTS1	7	RXD+	7	NC
8	CTS1	8	NC	8	NC
9	RI1	9	Voltage (note 2)	9	Voltage (note 2)

Note

150Ω termination resistors can be connected across transmit or receive lines by inserting jumpers JP5 and JP7. Refer to Appendix D.

COM2

The following table lists the signal definitions for the COM2 DB-9 connector.

Table C - 6. COM2 Connector Pinout

Pin	Signal
1	DCD2
2	RXD2
3	TXD2
4	DTR2
5	GND
6	DSR2
7	RTS2
8	CTS2
9	RI2

COM3

The following table lists the signal definitions for the COM3 DB-25 connector.

Table C - 7. COM3 Connector Pinout

Pin	Description	Pin	Description
1	CHASSIS GND	14	NC
2	TXD3	15	NC
3	RXD3	16	NC
4	RTS3	17	NC
5	CTS3	18	NC
6	DSR3	19	NC
7	GND	20	DTR3
8	DCD3	21	NC
9	NC	22	RI3
10	NC	23	NC
11	PB_RESET#	24	NC
12	NC	25	NC
13	NC		

Note: The P1 connector contains a remote system reset option. The reset jumper (JP1) shall be in position 1-2 in order to activate the Reset function. The PB_RESET pin shall be switched to GND to reset the entire board.

COM4

The following table lists the signal definitions for the COM4 DB-9 connector.

Table C - 8. COM4 Connector Pinout

Pin	Signal
1	DCD4
2	DSR4
3	RXD4
4	RTS4
5	TXD4
6	CTS4
7	DTR4
8	RI4
9	GND
10	NC

Note: COM4 to be employed when using a UPS type power supply containing RS-232 monitoring capability.

VGA Connector

The following table lists the signal definitions for the VGA DB-15 connector.

Table C - 9. VGA Connector Pinout

Pin	Signal
1	RED
2	GREEN
3	BLUE
4	NC
5	ORB_GND
6	ORB_GND
7	ORB_GND
8	ORB_GND

Pin	Signal
9	Fused VCC
10	ORB_GND
11	NC
12	DDCDAT
13	HSYNC
14	VSYNC
15	DDCCLK

APPENDIX D – AIM4 CONTROLLER JUMPERS

The following tables show the position and function of the controller jumpers.

Note: * Indicates factory default position.

Clear CMOS Settings

JP1	Description
1-2*	Normal Operation
2-3	Clear CMOS Settings

CPU Voltage Select

JP22	Voltage Select	CPU
1-2*	1.8V (400MHz FSB)	1.3Ghz Celeron M
2-3	1.5V (533MHz FSB)	2.0Ghz Pentium M

LCD Setup Settings

LCD Power Select

LCD Panel	JP9	LCD Voltage
12.1” AU Optronics	1-2	+3.3VDC
15” AU Optronics	1-2	+3.3VDC
Node Box Configuration	1-2	+3.3VDC

Note: +5VD operation is available when JP9 is in position 2-3

LCD Mode Selection

JP10	Operating Mode
2-3*	6-Bit Compatibility
1-2	8-Bit Compatibility

Note: Only specific LCD panels support these features

Normal/Reverse Scan Select

JP11	Scan Mode
2-3*	Normal Scan
1-2	Reverse Scan

Note: Only specific LCD panels support these features

LCD Resolution

JP13	JP14	JP15	JP16	Display Size	LCD Resolution
1-2	1-2	2-3	2-3	15”	1024 X 768
1-2	1-2	2-3	1-2	17”	1280 X 1024
1-2	1-2	1-2	2-3	12”	800 X 600
1-2	1-2	1-2	1-2	19”	1600 X 1200
1-2	1-2	1-2	2-3	N/A	Node Box Operation

CRT/LCD Select

JP17	Display Select
1-2	CRT & LCD
2-3*	CRT Only (Node Box Configuration)

HDD/CDROM Settings

SATA Mode Select

JP18	HDD Mode
1-2	Reserved
2-3*	IDE Mode

IDE1 Connector - Master/Slave Mode

JP19	IDE Master/ Slave Select
1-2	Master
2-3*	Slave

Note: Affective only when drive is physically jumpered for Cable Select

J5 Connector – CDROM Master/Slave Mode

JP20	CDROM Master/Slave Select	
1-2*	Master	Note 1
2-3	Slave	
1-2	Slave	Note 2
2-3*	Master	

Note:

1. Affective only when CDROM is programmed for Cable Select Mode
2. Affective only when CDROM is programmed for Reverse Cable Select Mode

IDE1 Connector – Voltage Select

JP21	IDE1 Voltage Select
1-2*	Compact Flash Mode: +3.3VDC
2-3	HDD, etc: +5VDC

Comm Port Settings

P2 - Comm 1 Connector Mode Configuration

Jumper	RS-232 Mode	RS-422 Mode	RS-485 Mode
JP2A	1-2*	2-3	2-3
JP2B	1-2*	2-3	2-3
JP2C	1-2*	2-3	2-3
JP2D	1-2*	2-3	2-3
JP2E	1-2*	2-3	2-3
JP2F	1-2*	2-3	2-3
JP2G	1-2*	2-3	2-3
JP2H	1-2*	2-3	2-3

Comm Configuration Jumper

JP8	Comm 1 Communication Mode
1-2	RS-485
2-3*	RS-422

P2 - RS-422/485 Terminator Configuration

Jumper	RS-422 Mode		RS-485 Mode	
	Terminator Out	Terminator In	Terminator Out	Terminator In
JP5	2-3*	1-2	2-3	1-2
JP7	2-3*	1-2	Note 1	Note 1

Note: 1. Jumper not used. Insert in factory default position.

P2 - Comm 1 External Voltage Select

JP3	Output Voltage at P2, Pin 9
1-2*	+5VDC Output
2-3	+12VDC Output

Note: Either +5VDC or +12VDC will appear on P2, Pin 9 when jumpered for RS-422 or RS-485.

P2 – Comm 1, RS-485 Transmit Gating Options

Transmit Enable	JP4	JP6
DTR Active	1-2*	3-4*
DTR Inactive	1-2	1-2
RTS Active	2-3	3-4
RTS Inactive	2-3	1-2
Auto Turn-Around	Note 1	5-6

Note: 1. Jumper not used. Insert in factory default position.

External Reset Enable – Comm 3

JP12	Description
1-2	External AIM4 Reset Active
2-3*	Normal Operation

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